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### (54) Title: ELECTROCHEMICAL DETECTION OF SPECIFIC BINDING

#### (57) Abstract

This invention relates to methods and apparatus for performing electrochemical analyses. The invention provides an electrochemical apparatus for performing potentiometric analyses for detecting specific binding between a first member of a biological binding pair immobilized on an electrochemical mediator. Methods for using the apparatus of the invention for performing binding and competition binding assays are provided. The invention also provides methods for performing high throughput screening assays for detecting inhibition of specific binding between the members of the biological binding pair for use in drug development, biochemical analysis and protein purification assays.

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### INTERNATIONAL SEARCH REPORT

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	ENTS CONSIDERED TO BE RELEVANT		· · · · · · · · · · · · · · · · · · ·	
Category °	Citation of document, with indication, where appropriate, of the rel	evant passages	Refevant to claim No.	
А	WO 96 41175 A (IGEN INCORPORATED) 19 December 1996 . see the whole document	)	1-60	
A	D.H. JOHNSTON ET AL.: "Trans-dioxorhenium(V)-mediated elctrocatalytic oxidation of DNA tin-oxide electrodes: voltammetri detection of DNA cleavage in solu INORGANIC CHEMISTRY, vol. 33, no. 26, 1994, pages 6388 XP000196454 washington dc usa cited in the application see the whole document	ic ution."	14	
	her documents are listed in the continuation of box C.	X Patent family members are listed	in annex.	
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report		Publication date		atent family member(s)	Publication date
WO 9641175	Α	19-12-1996	AU	6384496 A	30-12-1996
			CA	2223027 A	19-12-1996
		EP	0871887 A	21-10-1998	